# ANNUAL REPORT

## 1985 - 1986

Alberta

WATER RESOURCES COMMISSION

Alberta
WATER RESOURCES
COMMISSION

Office of the Chairman

910 Harley Court, 10045 - 111 Street, Edmonton, Alberta, Canada T5K 2M5 403/422-4232

February 11th, 1987

The Honourable Dr. P. N. Webber
Chairman, Economic Planning and
Resource Development

Sir:

I have the honour to present the Annual Report of the Water Resources Commission for the year ending March 31st, 1986.

Respectfully submitted,

Henry Kroeger, M.L.A.
Chairman

Alberta
ENERGY

228 Legislature Building, Edmonton, Alberta, Canada T5K 2B6 403/427-3740

Office of the Minister

February 12, 1987

Her Honour Helen Hunley
Lieutenant-Governor
of the Province of Alberta

Madam:

I have the honour to hereby transmit the Annual Report of the Water Resources Commission for the year ended March 31, 1986.

Respectfully submitted

Neil Webber

Neil Webber
Minister

# ALBERTA WATER RESOURCES COMMISSION ANNUAL REPORT — 1985 / 86

During this fiscal period, the Alberta Water Resources Commission continued its advisory role respecting policy relating to programs and projects. Emphasis was directed to the dependent relationship between water and land management. It was acknowledged that the economic and social strengths and requirements as they vary from region to region should influence water management decisions and investment.

The most intensive issues affecting water resources relate to the management of the supplies for all of the consumptive uses including the large demands for irrigation agriculture and the security of domestic and municipal supply; and, alternatively, to the drainage of surplus water from wetlands to improve the agricultural economy. For this reason, identifying the agricultural impacts and demands, together with potential benefits from provincial investment throughout the regions of the province having different requirements, has received increasing attention. The direct influence of market adequacy as a prerequisite to realizing benefits from water and land management investments was considered a major concern and an area where gains are necessary. The Commission has been directly involved in assessments of the agricultural land base studies and the drainage inventory study into the potential for effective expansion of the land base and its production.

A Commission panel assigned the responsibility for preparing a report and recommendations on the South Saskatchewan River Basin Planning Program considered water resources management on a broad basis. The development of recommendations took into account the questions of equity of public investment across the province, the capabilities of the province and landowners to invest and the significant regional physical and economic characteristics. Balance between supply management and the protection of valued instream uses was recommended.

> "External forces including the need for investment equity with other parts of the province, the impact of marketing the agricultural and industrial products and the overall provincial economy influence water management decisions".

The above statement, from the Issues and Principles section of the report being developed, illustrates the need seen by the Commission to weigh a very broad range of influences when considering water resources management and investment. The multidiscipline membership and forum of the Commission provided the broad base for considering these water resource management issues from both the supply and socio-economic demand sides.

## ISSUES AND ACTIVITIES

During the year, the Commission continued its consideration of water resource policy including the following issues and activities across the whole of the province:

— reviewed Energy & Natural Resources concerns and involvement in water resource management as it impacts fisheries and a wide range of public land uses, including the "Integrated Resource Management Planning" multidisciplinary process;

— monitored and supported sub-basin drainage planning in the smaller watersheds in the northwest area of the province starting with those having the most urgent drainage or supply

problems. This work is considered urgent to ready comprehensive information for on-going drainage programs and to be available prior to completion of the overall basin analysis. Public participation is encouraged;

— continued and expanded the Drainage Inventory Evaluation and Study for the province to provide more complete background on the wetland habitat resource and an enlarged economic evaluation component. The work this year also completed the evaluation of descriptive areas to provide a measure of drainability, increasing the number of areas to five. This evaluation was managed by Alberta Environment and has continuing sponsorship by the Alberta Water Resources Commission with study direction provided by an interdepartmental committee from Environment, Agriculture, and Energy and Natural Resources. As intended, this study provides a very important enchancement to the overall Agricultural Land Base analysis by identifying the drainage component impact affecting practical expansion of agricultural land in wetland zones;

— continued preparation of the South Saskatchewan River Basin report and recommendations by the assigned panel. Information meetings with departments and agencies were completed together with the development of supplementary evaluations to expand the background data. The panel emphasizes the importance of the public input and the use of this information in shaping recommendations. During the year, all sections of the report were written in draft form. The preliminary recommendations were also compiled by the end of the fiscal period. The report provides recommendations as advice for confirming, adapting or developing policy as opposed to prescribing process, or precise targets for programs. The management requirements for the basin are complex due to the multitude of uses to be served. The Commission's report is structured to be issue-oriented and in sufficient detail to provide meaningful information for policy review;

— participated in monitoring the continuing drought conditions which affected not only the southern part of the province but also areas in the Peace River block and east-central Alberta. Lack of precipitation and high temperatures were intense during the growing season for the second consecutive year. A provincial Drought Monitoring Committee again directed attention to emergency water supply needs and evaluation of factors and measures of the drought extent as advice to the government in making decisions on assistance programs. The back-to-back years (1984/85, 1985/86) of intense drought reduced water supply sources and seriously affected farm economics resulting in losses and debt increases. Recommendations were made to sustain water supply and to develop alternative sources to minimize recurrent emergency supply operations. Continued support for utilities type supply systems from secure water sources, the expansion of surface dugouts and testing and the development of groundwater projects, was urged by the Commission;

— reviewed preliminary drafts of the North American Waterfowl Management Plan draft. The principle of the plan was considered appropriate. The achievement of the goals and objectives through the support of both the United States and Canada together with private financial commitment, will be necessary to balance responsibility and benefits. The Commission recommended real involvement of the landowners including the need for incentives for them to justify their safeguarding habitat and to offset their economic loss as occasioned in providing benefits for the public as a whole. It was also apparent that the process of implementation had far reaching implications for government, landowners, and leaseholders, and much work would be necessary before projects of significant scale could be implemented. Nonetheless, the proposal was considered worthwhile for both social and economic reasons over the long term;

— undertook a review and consideration of long term water supply for Cold Lake heavy oil industrial consumption. The Commission confirmed agreement with the decision by Environment to allow industry to pipeline water from the North Saskatchewan River while preventing

wastewater discharge into surface water supplies;

— considered the adjustment of the cost-sharing formula supporting drainage projects and agreed that for equity reasons including the ability to pay, that the 86:14 cost-sharing formula concept as used for projects to rehabilitate irrigation systems could be applied. It was observed however that it will be necessary to reconsider all such formulas as economic parameters change;

— recommended that the government use the drainage inventory analysis and agricultural land base analysis together to make decisions on investment of provincial funds in enlarged drainage programs;

— reviewed the Inquiry on Federal Water Policy reports (Pearse Commission hearings). The highlight points considered were water quality, fisheries legislation, dispute arbitration, water pricing and conservation principles. The initial reaction to the report was that it was not sensitive to the regional economic and social differences respecting water use, particularly relating to the large scale consumption by irrigation. It was concluded that the report tended to generalize and would require considerable interpretation in order to be applied. On the other hand, the objective of developing long term national water policies is an important initiative;

— supported, together with the Environment and Agriculture departments, the presence and the viability of P.F.R.A. in the western provinces being maintained in order to concentrate on the unique prairie soils and water conditions and to reflect the needs of the prairie region. This position varies considerably from the proposition raised in the Inquiry on Federal Water Policy which was seen to diffuse the specific regional nature of the P.F.R.A. mandate and expertise by spreading it over Canada as a whole. It was deemed that the broad experience and demonstrated ability to react quickly to prairie water and soil problems justifies maintaining and even strengthening the present P.F.R.A. structure;

— participated in on-going consideration of groundwater licensing policy which will protect domestic and farm uses while allowing the oil well flood projects to proceed where the aquifers are able to sustain this multi-use;

— reviewed the Milk River basin planning as related to potential storage. Officials met with their Montana counterparts to describe potential management plans and environmental protection requirements, within the terms of the current international agreement dealing with apportionment. In general, Montana officials indicated that storage on Alberta's section of the Milk River would be beneficial to them. Discussions were limited to preliminary stages during this period;

— continued sponsorship of the agricultural land irrigability analysis undertaken in southern Alberta associated with potential irrigation areas. Concentrated this year on more regional distribution of the areas analyzed to extend ultimate choice options for allocating water and subsequent irrigation expansion;

— participated in monitoring the drainage problems and flood control projects in the Buffalo Bay area at the west end of Lesser Slave Lake and in the stabilization of Lesser Slave Lake itself. The Buffalo Bay area is subject to rather frequent overland flooding from the rivers feeding into the west end of Lesser Slave Lake through the delta topography which is very flat. Monitored investigative studies by Environment of the flooding including a number of control options and their resultant costs;

— investigated a computerized municipal and irrigation water supply control facility in Arizona including meetings with their officials on their conservation strategies. Transfers of water rights and uses are being made to satisfy growing municipal requirements due to major shifts from an agricultural to a recreation and tourism economy. It was observed that their water admin-

istration relies heavily on court adjudications of water rights. They have passed legislation through their State Legislature to regain some control of the quantity of water in water rights licences as a step towards sustaining their supplies of both surface and ground water which have deteriorated to the stage where major supply problems will occur near the turn of the century unless consumption and supply rates are balanced;

— reviewed the Oldman River dam project development particularly related to the planning for mitigation of impacts on fisheries resulting from the dam construction and operations;

— considered briefly a preliminary study framework to check the effects of land drainage on the hydrological cycles and potential for artificial recharging of groundwater aquifers;

— attended a seminar on preliminary evaluation of deep disposal of industrial wastewater related to industrial use of water for in-situ oil extraction;

— received presentations on utility type water supply and potential for municipal/irrigation water supplies using a combined system in the Red Deer River/Acadia Valley/Oyen/ Youngstown corridor; and

— commenced a review and restatement of the Commission's role, direction and procedures.

The Commission held eight regular meetings. A Commission panel and staff held 11 meetings respecting the development and writing of the report on water management on the South Saskatchewan River Basin including recommendations. The Commission and panel took part in urban drainage seminars, water management conferences and field tours.

## Climatic Impacts

For a second consecutive year, the general precipitation and snowpack preceeding the growing season had a significant impact over the province. Fall rains in late 1984 provided some moisture reserve, however, some of this was lost due to low snowfall throughout the province particularly in the High Level/Peace River area and in the east-central and southern parts of the province. Snowpack in the eastern slopes of the Rockies was again fairly good however low precipitation in the spring throughout the southern zone again placed considerable stress on crops of all types and heavy demands on irrigation. Drought conditions prevailed throughout most of the growing season in the southern zone and parts of northern Alberta. Fall rains in 1985, however, did improve the moisture level providing a reasonable reserve for crop germination in the spring of 1986.

The Commission participated in the monitoring of drought conditions which have been additive for two years in most areas in the southern portions of the province. The importance of managing water supplies for both small scale and large scale water use projects was demonstrated. The departments' emergency water supply operations were more responsive due to previous experience, greater concentration on timely schedules, and more efficient mobilization on manpower and equipment.

## South Saskatchewan River Basin Planning Program

### Report and Recommendations

Following the consolidation of the information from the study, the hearings, subsequent meetings with affected departments, agencies, and further investigative work, the structure for the report was developed as follows:

- background affecting water management
- water supply and use analysis
- water management issues including:
  - municipal/domestic use
  - habitat/recreation use
  - irrigation use
  - dryland agriculture
  - industrial use
  - hydroelectric power generation
  - groundwater
- water quality
- instream flow needs
- storage management
- multipurpose use and zoning
- water conservation
- allocation to apportionment
- licensing of surface water users
- administration

During the year, all sections were developed and written in draft form and recommendations were also prepared. By the end of the fiscal period, revisions had been completed up to draft four. The report was prepared on the basis of being a single document with an Executive Summary. All sections of the report development were undertaken by the Commission staff with direction and review by the panel of the Commission assigned this task following the hearings completed in 1984.

## Drainage Inventory

The Drainage Inventory Study, initiated in 1983, was expanded to increase background and evaluation of the wetlands habitat and, using agricultural economics, to bring into perspective the multi-use factors necessary for a comprehensive weighing of programs, benefits and impacts. The objectives of the study were:

1. to determine the amount of wetlands within the agricultural areas of the province;
2. to assess the feasibility of draining wetlands for agricultural production.

With the extended scope, the study is now expected to be completed and ready for release early in 1987. During the fiscal period, estimates of wetlands were made indicating approximately 10.8 million acres were involved in the white agricultural zone. The distribution of wetlands in the surveyed areas is illustrated on the attached bar graph plot.

Five descriptive areas throughout the province particularly oriented to zones having significant wetlands were evaluated to test the feasibility of drainage including the additional wetland habitat

factors and farm economy factors. A very important aspect of the study was to priorize drainability based on factors including the value of increased agricultural production, cost of on and off-farm drainage works, erosion and downstream flood protection, and the cost of mitigating valued wildlife and fisheries habitat losses. During this evaluation, the preliminary economic analysis indicated costs of drainage with wildlife mitigation in the Peace River basin alone would be near $1 billion for up to 3 million acres of agricultural land improvement. For consistency, the economic analysis uses the same methodology base as the Agricultural Land Base Study and allows first level estimates over the total wetland areas.

## Northern Sub-Basin Water Management

This planning program, directed by Alberta Environment with input from other affected departments, was initiated during this fiscal period, and was supported in part by the Commission. The purpose of the program is to progressively develop long range drainage management plans for the developed and developing areas of the Peace River and Lesser Slave Lake areas starting first with the sub-basins considered to have the earliest and more urgent water related problems.

The early objective is to have a sufficient number of small basin drainage plans completed on a comprehensive basis to guide immediate drainage projects while the larger basin long range drainage planning is being developed.

During the 1985/86 period, the first work centered on identifying and mapping the areas which were problems to landowners and local authorities, and co-ordinating this with the existing drainage networks. Approximately 100 sub-basins overall were priorized for detailed planning work in the Peace River and Lesser Slave Lake areas. Six of these sub-basins were selected for further work during 1986/87.

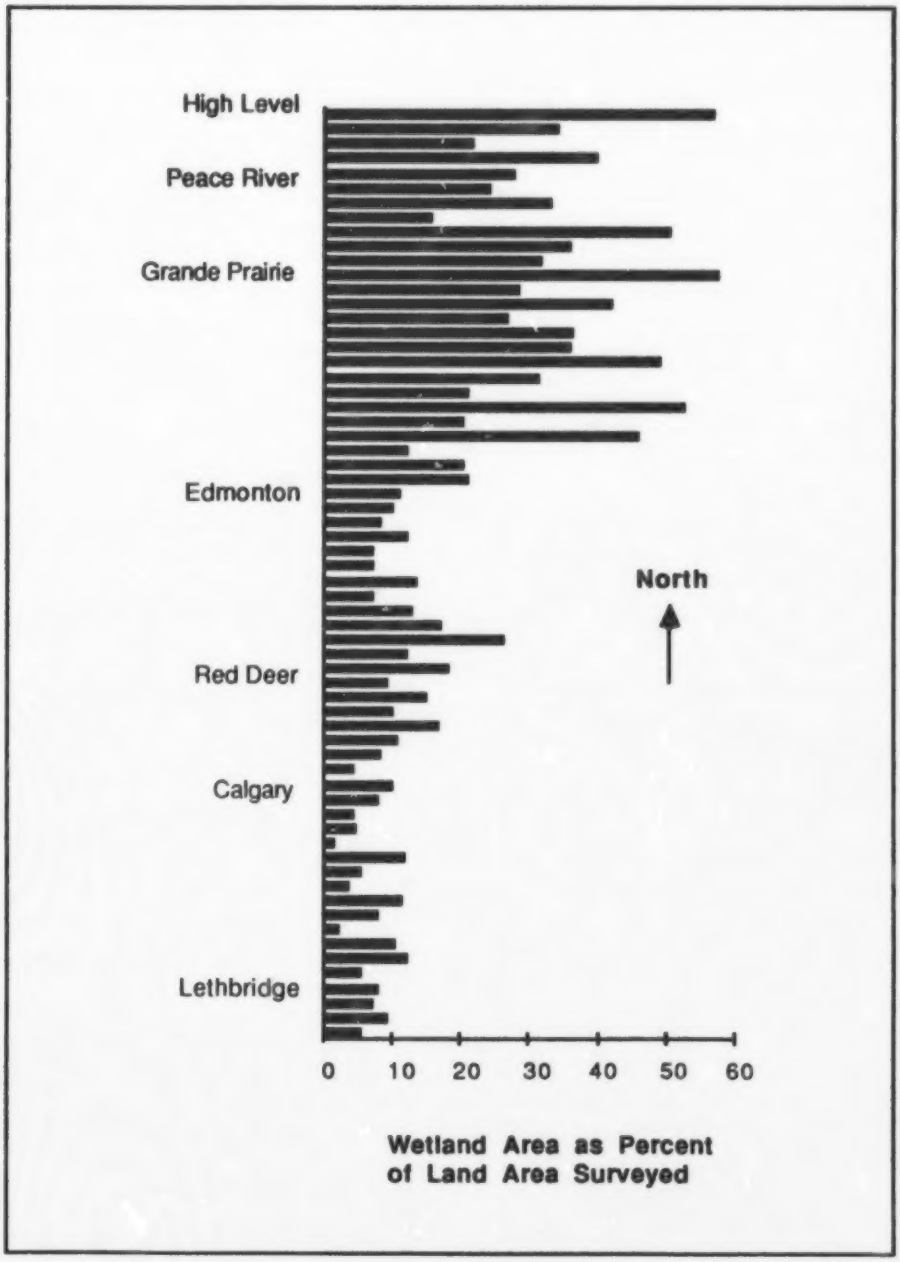
## Irrigability Analysis

This project, which was scheduled for a five-year period, has now been in force for two years. The total area completed by March 31st, 1986 was 1,005,780 acres. This year's work was more regionally distributed with areas done north of the Red Deer River in the Acadia Valley zone, south of the Red Deer River in the Majestic/Cavendish area, north of the Bow River near Bow Island, bordering both the Eastern and Bow River Irrigation Districts. The map, A.W.R.C. Land Inventory Project, shows the areas evaluated for irrigability.

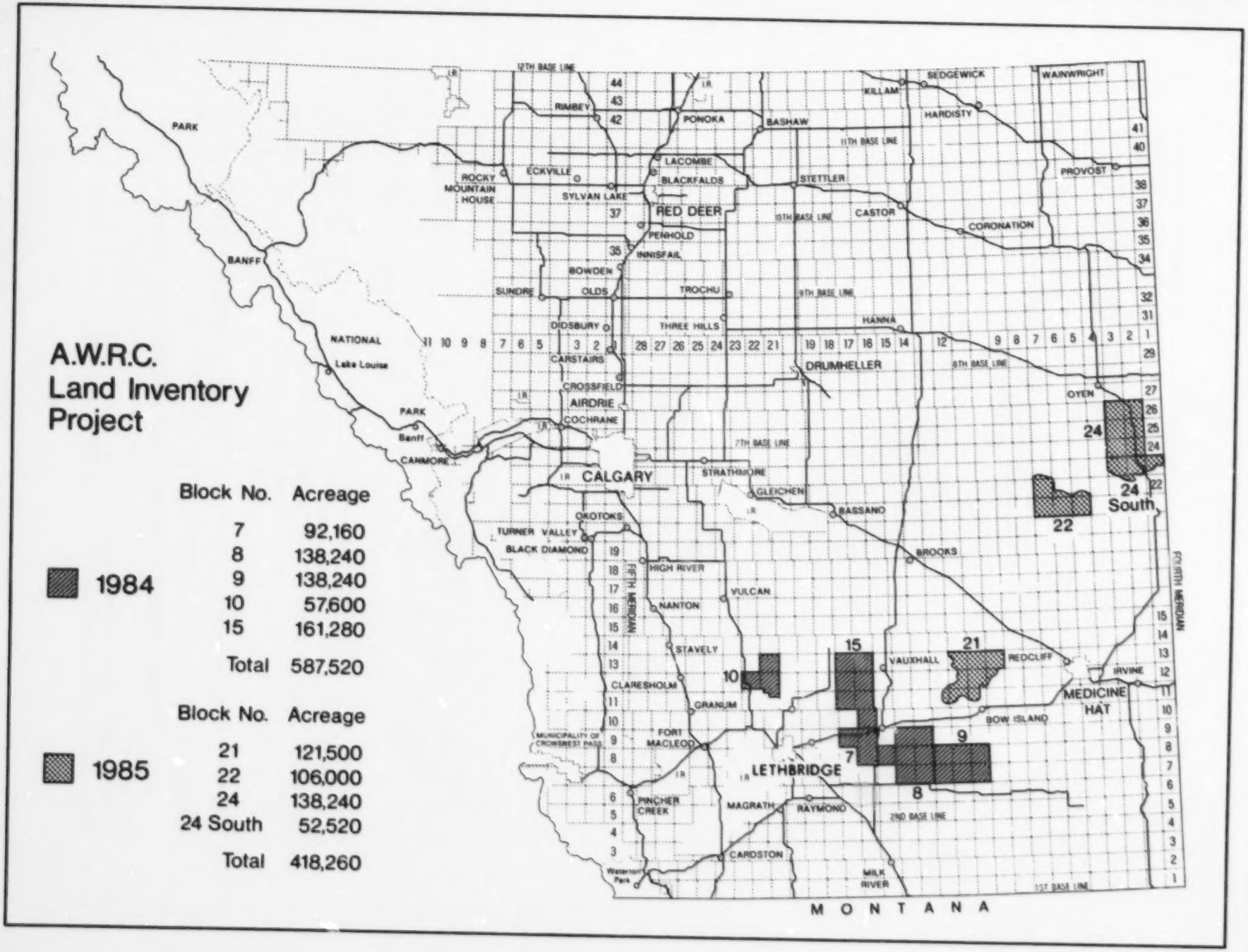
Emphasis in this program has been to extend the analysis on potential irrigable lands beyond the presently developed areas and in agro-climatic zones best suited for irrigation. This program is projected to continue throughout 1986 and be basically completed during the 1987/88 fiscal period.

## Agricultural Land Base Study

The Commission participated in a review and advisory role on the study by Agriculture, with particular reference to irrigation and other agricultural water uses and the drainage component, as it affects the potential for expansion of the agricultural base in wetland zones. This investigative study will provide significant information for priorizing land base and production expansion options.




**TOTAL WETLAND DENSITY IN SURVEYED AREA**


A.W.R.C.
Land Inventory
Project
1984
Block No. Acreage
7 92,160
8 138,240
9 138,240
10 57,600
15 161,280
Total 587,520
1985
Block No. Acreage
21 121,500
22 106,000
24 138,240
24 South 52,520
Total 418,260
12TH BASE LINE
11TH BASE LINE
10TH BASE LINE
9TH BASE LINE
8TH BASE LINE
7TH BASE LINE
2ND BASE LINE
1ST BASE LINE
FIFTH MERIDIAN
FOURTH MERIDIAN
PARK
BANFF
NATIONAL
Lake Louise
Banff
CANMORE
ROCKY MOUNTAIN HOUSE
ECKVILLE
RIMBEY
PONOKA
BASHAW
KILLAM
SEDGEWICK
HARDISTY
WAINWRIGHT
PROVOST
LACOMBE
BLACKFALDS
STETTLER
SYLVAN LAKE
RED DEER
CASTOR
CORONATION
PENHOLD
INNISFAIL
BOWDEN
SUNDRE
OLDS
TROCHU
DIDSBURY
THREE HILLS
HANNA
CARSTAIRS
DRUMHELLER
CROSSFIELD
AIRDRIE
COCHRANE
OYEN
CALGARY
STRATHMORE
GLEICHEN
BASSANO
OKOTOKS
TURNER VALLEY
BLACK DIAMOND
BROOKS
HIGH RIVER
VULCAN
NANTON
STAVELY
CLARESHOLM
GRANUM
VAUXHALL
REDCLIFF
IRVINE
MEDICINE HAT
BOW ISLAND
MUNICIPALITY OF CROWSNEST PASS
FORT MACLEOD
LETHBRIDGE
PINCHER CREEK
MAGRATH
RAYMOND
CARDSTON
Waterton Park
MILK RIVER
MONTANA

# ALBERTA WATER RESOURCES COMMISSION